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MCST STATUS

MODIS SCIENCE TEAM MEETING

MAY 4-6, 1994

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Attachment 5

MODIS CALIBRATION STAFF

MODIS CALIBRATION SCIENTIST Dr. Phil Slater/
Univ. of Arizona

- Science Team Member
- Member, ASTER Science Team
- Primary Reviewer, MCST activities
- Provider of Vicarious Calibration Services
- Consultant for Algorithm Development

Head, MCST Dr. Bruce Guenther/GSFC (Acting)

- Responsible for MODIS Calibration
- EOS Calibration Scientist

Head, MAT Dr. Harry Montgomery/GSFC

- Algorithms for Level 1B Calibration Products
- Sensor Development Oversight
- Second Generation Algorithm Development
- Integration of Different Sources of Calibration Data

RESCOPED CORE LEVEL 1B ALGORITHM

Core Level 1B algorithm (*for PGS processing*)

- Primary content: On-Board Calibrators (OBC)
- TBD: cross-talk/ghosting/stray light effects

Auxiliary algorithm (*not part of Level 1b Algorithm for SCF processing*)

- Over-lapping pixel effects via "bow-tie" analysis
- Image processing products
- Improved calibration approaches , research and development

- Masking algorithms reassigned to Menzel
- No resampling or "replacing" dead pixels

ACCOMPLISHMENTS

- Team Organized, primarily directed towards use of On-Board Calibrators
- Rescoped core Level 1B algorithm
- Calibration Panel developed: *Consensus Statement on Lunar Viewing*
- Published a combined Calibration Plan/ATBD with Phil Slater
- Completed Calibration Peer Review*

* Skip Reber (Chair/GSFC), Phil Teillet (Canada Centre for Remote Sensing), Mike Weinreb (NOAA/NESDIS), Carol Johnson (NIST), Carol Bruegge (JPL/MISR), Robert Lee (LaRC/CERES)

RISK ASSESSMENT

- Little or no validation of IR calibration other than in Level 2 products
- Replan moves Engineering Model testing forward in time; strain on MCST and SBRC software
- Engineering Model (*in draft SBRC Replan*)
  - Testing significantly reduced
  - No SRCA or SD/SDSM; T/V data available in 4/96 - 10 month slip
  - Later algorithm delivery
  - Restrictions on interfaces to SBRC

CONSENSUS STATEMENT ON LUNAR VIEWING

The consensus of the Earth Observing System Investigator Working Group's Calibration Panel is that pointing the Nadir face of the AM1 spacecraft toward the moon during spacecraft eclipses may offer significant benefits for each instrument. The benefits include: 1) use of the intrinsic lunar stability for monitoring long-term radiometric response; 2) characterize/monitor geometric Modulation-Transfer-Function and stray light sensitivity; 3) use of extended cold space look (map the zero level across the scan, when the moon is NOT in the scan).

For ASTER, the VNIR and SWIR benefit in the radiometric and geometric areas, and the TIR gains the geometric and zero-radiance benefit. MODIS benefits in all three areas. MISR benefits in the radiometric and geometric areas. MOPITT and CERES benefit from the extended cold space look.

The desired maneuver to be executed is approximately a "pitch-hold" for one orbit, except in the case of MISR where the best results are obtained with a "pitch-scan" [this requires further study]. We believe that each instrument team now should analyze the likely behavior of their instrument during these maneuvers, and that the AM Project should plan for this spacecraft to execute one of these maneuvers several times (Note in proof - quarterly) during the lifetime of this mission.

Further, this Calibration Panel recognizes the necessity of radiometric characterization of the lunar radiance through a ground-based research program (already initiated), including at least a 4.5 year mapping of lunar radiance over the 0.4 to 2.5 micrometer region. Rapid completion of this mapping activity is recommended so that the full database is available to EOS AM1 investigators near the time of launch of the AM1 spacecraft.

The Panel further recommends that future spacecraft be designed with this maneuver capability to allow radiometric cross-calibration of imaging instruments through a lunar map database and for the other calibrations described above.